

drift region between the source region and the drain region, the drift region including a retrograde region below the surface of the substrate having an impurity concentration distribution such that an impurity concentration of the retrograde region increases relative to that of adjacent portions of the drift region.

**15.** A method of forming a metal-oxide semiconductor (MOS) transistor, the method comprising:

forming a source region and a drain region in a semiconductor substrate adjacent a surface thereof; and

forming a drift region in the semiconductor substrate having an impurity concentration distribution such that a peak impurity concentration of the drift region is displaced from the surface of the substrate.

**16.** The method of claim 15, wherein forming the drift region comprises:

forming a retrograde region below the surface of the substrate and separated therefrom by a predetermined distance, wherein the retrograde region has an impurity concentration greater than an impurity concentration of a portion of the drift region adjacent the surface of the substrate, and wherein the peak impurity concentration of the drift region is provided in a portion of the retrograde region.

**17.** The method of claim 16, wherein an impurity concentration of the drift region decreases between a portion of the drift region adjacent the surface of the substrate and the retrograde region.

**18.** The method of claim 16, wherein an impurity concentration of the drift region decreases between the retrograde region and a surface of the substrate opposite the source and drain regions.

**19.** The method of claim 16, wherein forming the retrograde region comprises:

forming the retrograde region so that the portion of the retrograde region having the peak impurity concentration is displaced from the surface of the substrate by a distance of about 1 micrometer ( $\mu\text{m}$ ) to about 3 micrometers ( $\mu\text{m}$ ).

**20.** The method of claim 16, wherein forming the retrograde region comprises:

forming the retrograde region to laterally extend at the predetermined distance below the surface of the substrate and under the drain region.

**21.** The method of claim 20, wherein forming the retrograde region further comprises:

forming the retrograde region such that an edge of the retrograde region is aligned with an edge of the drain region.

**22.** The method of claim 16, further comprising:

forming a field insulating layer on the surface of the substrate adjacent the drift region and between the source region and the drain region,

wherein the retrograde region laterally extends at the predetermined distance below the surface of the substrate and under the drain region and the field insulating layer.

**23.** The method of claim 16, further comprising:

forming a body region adjacent the drift region and adjacent the surface of the substrate,

wherein forming the retrograde region comprises forming the retrograde region to be separated from the body region.

**24.** The method of claim 23, wherein the drift region comprises a first conductivity type, and wherein forming the body region comprises:

implanting impurity ions of second conductivity type into the substrate.

**25.** The method of claim 15, wherein forming the drift region comprises:

implanting impurity ions of a first conductivity type into the substrate at a first implantation energy to provide an initial impurity concentration distribution; and

implanting impurity ions of the first conductivity type into the substrate at a second implantation energy greater than the first implantation energy to provide the impurity concentration distribution having the peak impurity concentration displaced from the surface of the substrate.

**26.** The method of claim 25, wherein the initial impurity concentration distribution has a peak impurity concentration adjacent the surface of the substrate.

**27.** The method of claim 25, wherein implanting the impurity ions at the second implantation energy comprises:

implanting the impurity ions using an implantation energy of about 2000 keV to about 7000 keV.

**28.** The method of claim 25, wherein implanting the impurity ions at the second implantation energy comprises:

implanting the impurity ions at a dose of about  $5 \times 10^{11}$  ions/ $\text{cm}^2$  to about  $2 \times 10^{12}$  ions/ $\text{cm}^2$ .

**29.** The method of claim 15, further comprising:

forming a gate insulating layer on the surface of the substrate adjacent the drift region and between the source region and the drain region; and

forming a gate electrode on the gate insulating layer.

**30.** The method of claim 15, further comprising:

forming a buried insulating layer; and

forming the semiconductor substrate on the buried insulating layer to define a semiconductor-on-insulator (SOI) substrate.

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